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Subject: FW: TZW report DEQ PM Feedback
Date: 12/15/2006 02:02 PM

Eric, Chip, Rene and Kristine,

Attached below is feedback from the DEQ PM/teams on the LWG TZW data for the Arco, ExxonMobil and SLLI (Rhône Poulenc sites). Our review is not comprehensive, but given everyone's work load it is what I have right now. The PMs answered a number of questions relative to the TZW data. Let me know if you have any questions.

Matt

Matt-

I reviewed the 8/7/06 LWG TZW report's sections on Arco and ExxonMobil and have the following responses to your queries.

Arco

1. Is the area of apparent groundwater discharge and transition zone groundwater (TZW) data consistent with the upland conceptual hydrogeologic model?
Yes.
2. Do you think additional sampling is necessary to obtain representative TZW data to conduct a TZW risk assessment representative of the groundwater pathway from upland sources?
No.
3. Is the characterization of TZW adequate or are the data gaps (e.g., nature and extent)? If so please elaborate and propose recommended sampling points/strategies.
The characterization appears adequate.
4. Did the TZW data contain any surprises which will result in additional upland groundwater characterization?
Section 5.3.1 points out two VOCs in TZW that exceed screening levels, TCE and 1,2-DCA, neither of which are upland COIs. I do not believe these VOCs are migrating from the subject site and do not plan additional investigation into this.
5. Do you agree/disagree with the LWG assessment/conclusions relative to TZW adjacent to your site?
I agree with their conclusions, but have the following comments:

Section 5.1 The table summarizing upland groundwater consists solely of grab samples. I'm surprised they did not rely more on data from monitoring wells. There are seven multi-channel tubing monitoring wells along the site's shoreline (CMT1-7) that allow groundwater sampling at various depths and an off-site monitoring well to the north (LPMW-01), and we have four quarters of data from 2005; this data set appears more appropriate to use in comparison to TZW data than what the LWG presented. This upland multi-depth groundwater data should be used in the LWG cross sections (Figures 5-5b-i) to interpret contaminant migration to TZW sampling points, as well as recent nearshore and revetment lithology and contaminant

characterization data.

The last paragraph of this section describes how the current seawall and hydraulic controls are mostly, but not completely effective in providing source control. The text should recognize that most of these concerns, including a “detached” plume east of the seawall, will be addressed next year when Arco constructs a deeper, replacement sheetpile barrier wall and removes contaminated sediment to the east.

Section 5.3.1 TCE and 1,2-DCA are not upland site COIs and their detection in TZW samples is not believed to be related to the upland site.

Section 5.3.3 Using the more appropriate upland groundwater data described in the comment on Section 5.1, their statement that “TPH-D concentrations observed in TZW samples are all higher than those observed in the upland nearshore groundwater” is incorrect. For example, TPH-D ranged from 0.34 to 3.6 mg/L in TZW and up to 7.4 mg/l in upland nearshore wells (2005 data from CMT wells). The statement that these patterns are similar to those observed at the ExxonMobil site is also incorrect (see ExxonMobil comment on Section 6.5).

This significant decrease in TPH concentrations moving from upland nearshore wells to TZW sample locations may be indicative of the effectiveness of the existing seawall and hydraulic containment source control measures; Arco plans additional upland and nearshore source control measures and investigation on their effectiveness in preventing contaminant migration to the river.

ExxonMobil

1. Is the area of apparent groundwater discharge and transition zone groundwater (TZW) data consistent with the upland conceptual hydrogeologic model?
Yes.
2. Do you think additional sampling is necessary to obtain representative TZW data to conduct a TZW risk assessment representative of the groundwater pathway from upland sources?
No.
3. Is the characterization of TZW adequate or are the data gaps (e.g., nature and extent)? If so please elaborate and propose recommended sampling points/strategies.
The characterization appears adequate.
4. Did the TZW data contain any surprises which will result in additional upland groundwater characterization?
Not really, but see comment on Section 6.5.
5. Do you agree/disagree with the LWG assessment/conclusions relative to TZW adjacent to your site?

I generally agree with their conclusions, but have the following

comments:

Section 6.1 The upland groundwater quality table uses data from 2003, yet there is more recent data from 2005-2006 which should be used. Also, the groundwater monitoring wells KMW01-19 are not “shoreline” wells, and the recently installed wells KMW29-30 and 36-37 (located in the barrier wall gap, each with six quarters of data)

appear to be more representative of groundwater migrating from the site to the Willamette River. This also affects the presentation in Figure 6-5a.

Section 6.5 Perhaps because of the upland groundwater data set they chose to use (see comment on Section 6.1), their statement that "TPH-G and TPH-D concentrations are substantially higher in the TZW than in the nearshore upland groundwater" is incorrect. The opposite is true: for example, TPH-D ranged from 0.35 to 3.6 mg/L in TZW and up to 14.8 mg/l in upland nearshore wells (5/06 data from KMW29-30 and 36-37). While this significant decrease in TPH concentrations moving from upland nearshore wells to TZW sample locations is welcome, the magnitude of decrease in the approximately 100 lateral feet between the two sampling locations is somewhat unexpected.

Note that DEQ is pressing ExxonMobil to enhance the source control measures in the downstream portion of their site (area between the slurry wall and the Arco facility), based on high diesel and As detections in upland riverbank wells. The LWG TZW data suggests that the plume rapidly attenuates. This is an area that we may want additional in-water testing to confirm the initial results. It is also something that ExxonMobil may propose to conduct in lieu of additional source control measures. Matt

Thanks-

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SLLI (Rhone Poulenc)

1. Is the area of apparent groundwater discharge and transition zone groundwater (TZW) data consistent with the upland conceptual hydrogeologic model?
Yes, where we have data near the riverbank. The discharge zone at RP-03 may represent a "worst case," but the evaluation does not fully address whether the deep alluvium/basalt groundwater also discharges further out in the river channel and further downstream. It would have helped if either the upland cross sections (9-5b through 9-5e) which show stratigraphy were extended out into the river or the in-water cross sections (9-6a through 9-6f) TZW profiles showed the stratigraphy, and to add a figure that shows the complete river profile from bank to bank. This would better illustrate whether the upland alluvial gravels are associated with the sandy discharge zone at RP-03 and whether or not "the basalt does not outcrop in the river" as indicated on page 68 (it comes within 6 feet of the riverbottom based on City CSO borings). The text does not indicate whether the alluvial gravels outcrop in the river.
2. Do you think additional sampling is necessary to obtain representative TZW data to conduct a TZW risk assessment representative of the groundwater pathway from upland sources?
No. Although the data set is limited, the sampling conducted does appear to be representative.
3. Is the characterization of TZW adequate or are the data gaps (e.g., nature and extent)? If so please elaborate and propose recommended sampling points/strategies.

Generally it is adequate. A first next step would be to include the TZW data to the north at Siltronic and to the south at Arkema in the evaluation, given the breadth of the upland Rhone Poulenc groundwater plume. Also, as noted above, consider looking further out in the river channel.

4. Did the TZW data contain any surprises which will result in additional upland groundwater characterization?

Yes. The identification of two relatively discrete discharge zones, particularly the sandy zone north of the railroad bridge, will help focus additional groundwater characterization upland. The sandy zone north of the railroad bridge is consistent with a "trough" in the surface of the basalt acting as a preferential groundwater flow pathway. SLLI (Rhone Poulenc) and their consultant AMEC have already proposed an update to the site conceptual model and are using the information to locate wells and propose interim source control measures.

5. Do you agree/disagree with the LWG assessment/conclusions relative to TZW adjacent to your site?

Generally, yes.

Tom Roick

SLLI (Rhone Poulenc)

I have reviewed the section of the LWG summary report for groundwater sampling. The following are my comments with respect to the questions posed.

1. TZW data consistent with RPAC model? I would have to say it appears strongly linked. However, RPAC is focusing on the gravel zone above the bedrock as the main transport pathway and there should be a better depiction of the connectivity of the gravel with the sandy discharge area and the near shore discharge area. The near shore discharge area seems like it is too shallow for the main transport pathway for RPAC. I also agree that the cross sections should be extended farther out into the river. I also think that the A-A' and B-B' cross sections should be coordinated a little better with the main RPAC cross section (they are not even shown on the same map to get a sense of orientation and scale for the river portions).

2. Additional sampling for risk assessment? It is a small data set. It would be consistent with screening using maximum concentrations.

3. Is TZW characterization adequate? A better interpretation and presentation of existing information would be a good next step. Sounds like RPAC is going to do that at least for the upland information. Do we know if they would intend to incorporate the LWG data into a revision of the site model?

4. Did the TZW data contain surprises? No and yes. We knew that the "plume" had to go somewhere so this verifies the anticipated discharge. I was surprised by the levels of some dissolved metals and don't know off hand how they compare to the upland concentrations; manganese is one that seems really high.

5. Agree/disagree with the LWG assessment? Yes and I look forward to any better coordination between the RPAC upland and LWG data and depictions.

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